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APPENDIX IV
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APPENDIX IV SPECIAL TOPICS

ANTIMICROBIAL RESISTANCE – Washington State Department of Health

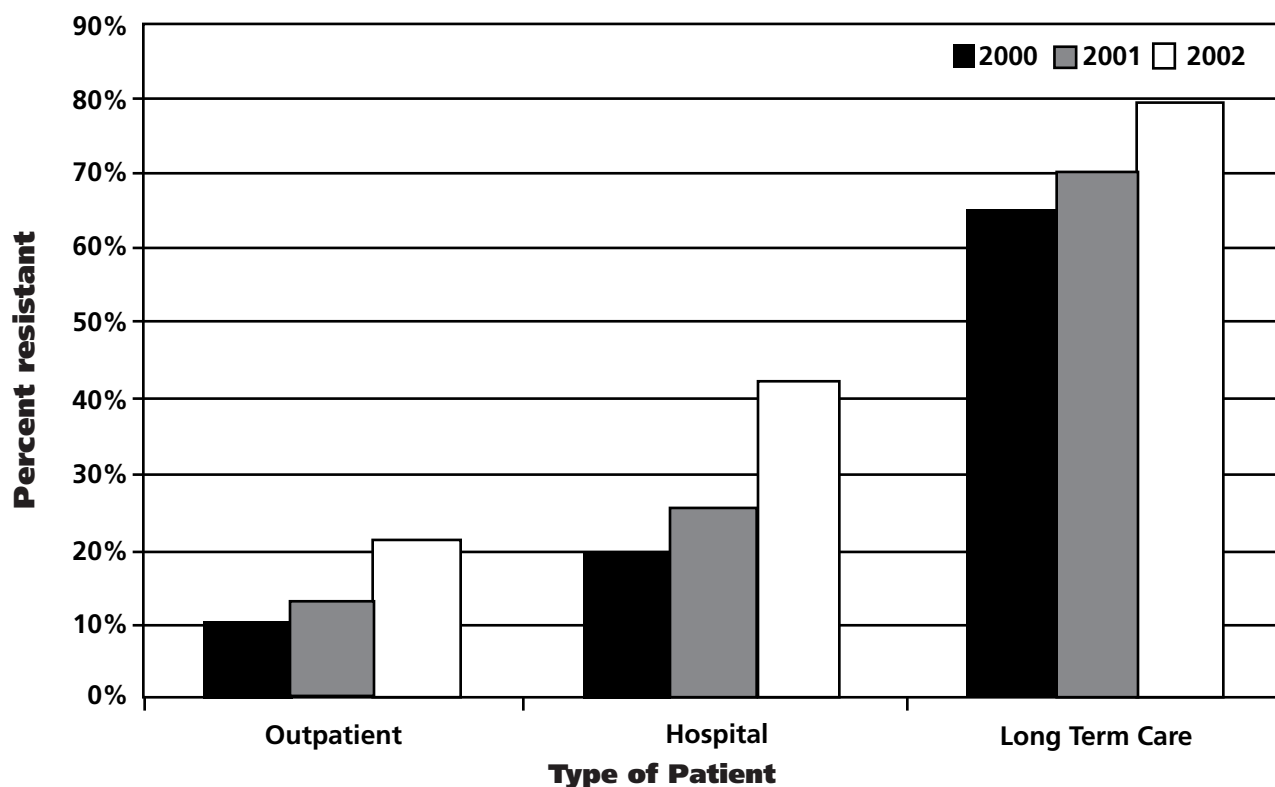
Bacteria that acquire resistance to previously effective antimicrobial drugs cause prolongation of illness, increase health care costs, and raise the specter of a future with fewer choices for the treatment of infectious diseases. There are several risk factors common to infections caused by various resistant bacteria. These include previous or current antibiotic therapy, hospitalization or residence in a long-term care facility, underlying illness, invasive medical procedures or devices, and very young or old age.

Although infections caused by antibiotic resistant bacteria are not routinely notifiable in Washington State, hospitals and laboratories are asked to participate in a network of sentinel reporters to provide information on trends of resistance. In 2002, thirty facilities providing laboratory services to inpatient and/or outpatient populations provided information to DOH, including Cumulative Antimicrobial Susceptibility Test Data (antibiograms) and reports of invasive pneumococcal infection. This type of information does not provide incidence rates for disease, but does give estimates of the prevalence (percent) of resistance among organisms that have been identified by laboratory diagnosis.

Methicillin Resistant *Staphylococcus aureus* (MRSA): *S. aureus*, often simply called “staph” is frequently found on the skin or in the nose of healthy people without causing illness. However, it can cause minor and major illnesses; including pustules, boils, abscesses, wound infections, pneumonia or life threatening bacteremia. MRSA are staph that have developed resistance to all penicillins as well as to the cephalosporins (e.g. Keflex®) commonly used empirically to treat skin infections. MRSA is a serious problem in health care institutions and is now also appearing in the community in persons without the common risk factors for MRSA infection. The infection is spread by direct contact with persons who are infected or are carriers of the organism. Good hand hygiene and infection control precautions by health care workers decrease transmission.

The prevalence of MRSA is increasing in Washington State, as it is in other parts of the country. In 2002, thirty-one percent of all reported *S. aureus* isolates causing invasive and non-invasive disease were methicillin resistant. The average yearly increase in MRSA prevalence has been 6.5% over the three years that data from across the state have been aggregated. The prevalence of MRSA for cultures taken from only hospitalized patients was 42%, with methicillin resistance among hospital isolates varying among regions of the state from 34% to 52%. Prevalence of MRSA was highest among cultures taken from resident of long term care facilities (79%).

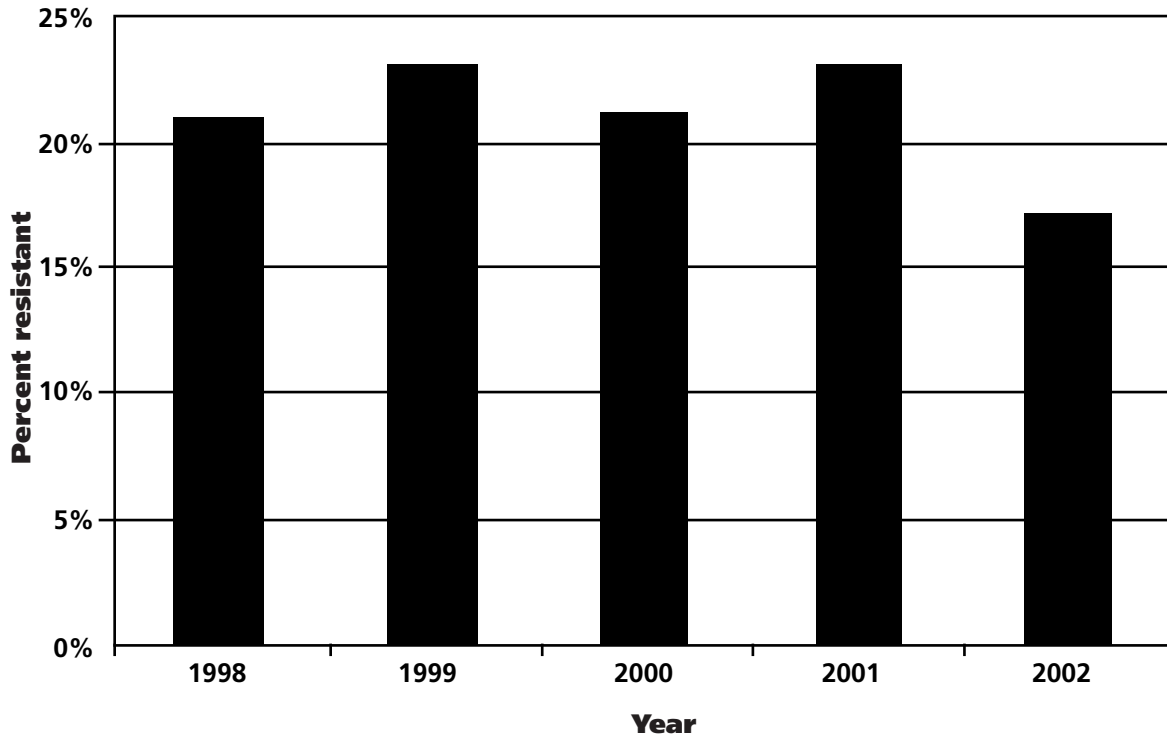
Increase in MRSA over Three Years



***Streptococcus pneumoniae* Invasive Disease:** *S. pneumoniae* (pneumococcus) is an important cause of otitis and sinusitis, pneumonia, meningitis and bacteremia, and is a leading cause worldwide of illness and death in young children, debilitated persons and the elderly. Pneumococci are commonly found in the upper respiratory tract and are transmitted by person-to-person and respiratory droplet spread. Since the introduction of the pneumococcal conjugate vaccine for children in 2000, the incidence of invasive disease in the United States has begun to decline in the age groups affected by the vaccine.

Two hundred and thirty-one cases of invasive pneumococcal infection (with *S. pneumoniae* isolated from blood or spinal fluid) were reported to DOH in 2002. As many as 40% of pneumococcal infections in some parts of the US are resistant to penicillin. In Washington, intermediate or complete resistance to penicillin, (usually the antibiotic of choice) rose to 21% by 1998. After remaining somewhat stable for the intervening years, non-susceptibility decreased in 2002 to 17%. This corresponds to a small but declining trend in resistance seen in some, but not all, parts of the country. The rate of non-susceptibility to penicillin was significantly greater for children less than twelve years old (37%) than for adults (13%).

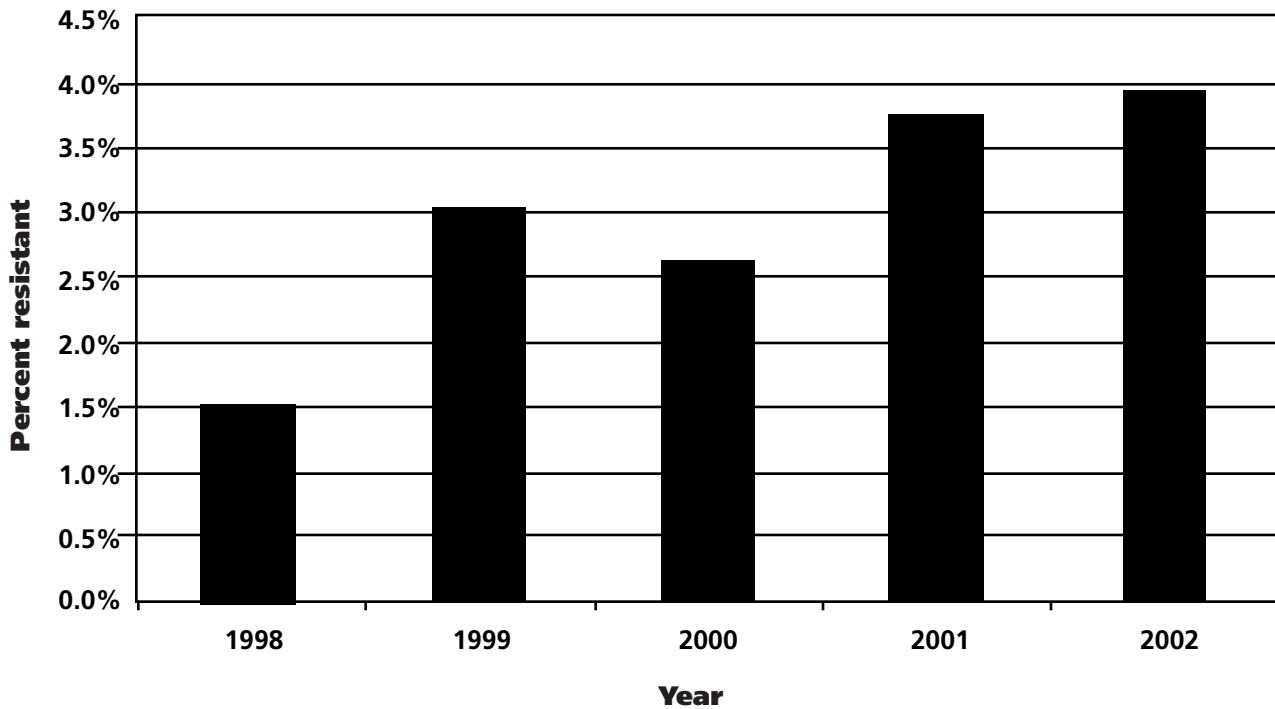
Invasive Streptococcus Pneumoniae
Percent Non-susceptible to penicillin



Vancomycin Resistant Enterococcus (VRE): Enterococci are bacteria that normally inhabit the bowels of humans and other warm-blooded animals. These bacteria have the ability to cause a variety of serious conditions in hospital patients, including urinary tract and wound infections, endocarditis, and bacteremia. These organisms are inherently resistant to some antibiotics, and can acquire resistance to most others in an environment of exposure to multiple antibiotics. Vancomycin is the only drug that remains effective in many cases of enterococcal infection. Vancomycin resistance is also monitored closely because enterococci have the ability to readily exchange resistance genes with a number of other organisms for which vancomycin is an important treatment option.

VRE isolates come mainly from hospitalized patients who are colonized or infected (with either invasive or noninvasive disease) with Enterococcus. The prevalence of VRE, while at low levels, has increased over the past five years from 1.5% to almost 4 % in 2002. This is lower than the national reported average of 12% VRE isolated from hospitalized patients.

Vancomycin Resistant Enterococci (VRE)



Prevention: Prevention and control efforts consist of programs to prevent the spread of resistant organisms in health care settings, and to promote the judicious use of antibiotics. Strategies include surveillance and culturing to identify resistant organisms, the use of contact precautions by health care workers, medical practice guidelines for appropriate anti-infective therapies, public and health care provider education on antibiotic use and misuse, auditing of antimicrobial use patterns in health care organizations, and restrictions on the use of certain key drugs.